

DEPARTMENT OF COMMERCE

BUREAU OF STANDARDS

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UNITED STATES GOVERNMENT MASTER SPECIFICATION FOR
MATTING, RUBBER, FOR USE AROUND ELECTRICAL APPARA-
TUS OR CIRCUITS NOT EXCEEDING 3,000 VOLTS TO GROUND

FEDERAL SPECIFICATIONS BOARD SPECIFICATION No. 414

This specification was officially promulgated by the Federal Specifications Board on May 22, 1926, for the use of the departments and independent establishments of the Government in the purchase of rubber matting for use around electrical apparatus or circuits not exceeding 3,000 volts to ground.

[The latest date on which the technical requirements of this specification shall become mandatory for all departments and independent establishments of the Government is August 22, 1926. They may be put into effect, however, at any earlier date, after promulgation.]

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I. GENERAL SPECIFICATIONS

All physical tests shall be conducted in accordance with the methods described in United States Government General Specifications for Rubber Goods, Federal Specifications Board specification

No. 59, in effect on date of proposal. The essential features of these methods are:

1. Temperature of testing room and of specimens, between 65 and 90° F.
2. Rate of separation of jaws of testing machine, 20 inches per minute.
3. Tensile strength and elongation shall be made on one lot of samples and "set" on a separate lot of samples.
4. Set test shall be made by stretching the 2-inch gauge length to the specified length, holding for 10 minutes and measuring the distance between gauge marks 10 minutes after release.

All electrical tests shall be conducted in accordance with the methods described in Section VI, 4.

II. GRADE

Matting shall be of a single grade and suitable for use as a floor covering near electrical apparatus.

III. MATERIAL AND WORKMANSHIP

The matting shall consist of a rubber compound corrugated on one surface and backed with cotton fabric or having one or more cotton fabric inserts, the back of the matting being finished with cloth imprint.

Matting shall be free from patches, blisters, pinholes, cracks, protuberances, embedded foreign matter, or other physical defects which can be detected by thorough surface inspection.

IV. GENERAL REQUIREMENTS

See Section V.

V. DETAIL REQUIREMENTS

1. THICKNESS

The thickness, unless otherwise specified, shall be not less than one-fourth inch when measured over the corrugations and not less than one-eighth inch at the root of the corrugations.

2. PHYSICAL TESTS

Tests to determine strength, elongation, and set shall be made on the rubber exclusive of the fabric, using test pieces one-half inch wide.

(a) **TENSILE STRENGTH.**—The tensile strength shall be not less than 700 pounds per square inch.

(b) **ELONGATION.**—The elongation at the breaking load shall be such that the original 2-inch gauge length of the test specimens shall stretch to not less than 7 inches.

(c) **SET.**—The set, following a stretch from 2 to 5 inches, shall not exceed 25 per cent.

3. ELECTRICAL TESTS

(a) **VOLTAGE TEST.**—At a potential of 15,000 volts the matting shall not puncture, become appreciably warm at any spot, or show any other sign of weakness.

(b) **DIELECTRIC STRENGTH TEST.**—The matting shall not fail at less than 40,000 volts.

VI. METHODS OF INSPECTION AND TESTS

1. SAMPLING

(a) Not less than one sample shall be taken from each piece or roll of matting offered for delivery and subjected to the physical and dielectric strength tests (V, 2, and V, 3, (b)).

(b) The voltage test shall be conducted on the entire area of matting offered for delivery.

2. INSPECTION

(a) **VOLTAGE TEST.**—The matting shall be tested between electrodes consisting of rectangular metal sheets, having smoothly rounded edges and corners and of any convenient length. The width shall be such that arcing around the edges of the matting will not occur. The tests shall be made progressively until the entire length of the matting has been covered, the voltage being applied for one minute at each position of the electrodes.

(b) **DIELECTRIC STRENGTH TEST.**—A specimen shall be cut from the sample (VI, 1) and tested to failure in air between 2-inch disk electrodes with edges rounded to a radius of one-fourth inch. The voltage shall be applied at the rate specified in VI, 4.

(c) **MATTING.**—The matting shall be inspected and tested within four weeks of the date of delivery.

3. REJECTION

Any piece or roll of matting which fails to pass any of the requirements of this specification shall be rejected.

In case of failure to pass any one of the tests specified in Section V, 2, or V, 3 (b) the piece or roll of matting represented by the sample subjected to these tests shall be rejected.

4. PROCEDURE FOR ELECTRICAL TESTS

(a) SOURCE OF TEST VOLTAGE.—The testing voltage shall be obtained from a testing equipment no part of which has a capacity of less than one-half kilovolt ampere per square foot of electrode surface. In no case shall the rating of any part of the testing apparatus be less than 5 kilovolt amperes. The frequency of the testing voltage shall be not more than 65 cycles.

(b) APPLICATION OF TEST VOLTAGE.—The potential shall be applied at a low value and gradually and steadily raised at a rate of approximately 800 to 1,000 volts per second until the prescribed testing voltage is reached.

(c) TEST PERIODS.—The test periods shall be counted from the instant when the prescribed testing voltage is reached.

(d) VOLTAGE REGULATION.—The method of regulating the testing voltage shall be one which does not distort the wave form of the testing voltage from a sine wave. Acceptable methods include:

- (1) Field regulation of the alternator supplying the transformer.
- (2) Induction-type regulator.
- (3) Variable-ratio-transformer type of regulator.

(4) Potentiometer type of rheostatic control where the current in the portion of the potentiometer resistance in parallel with the primary of the transformer is at least five times the exciting current of the transformer.

(e) VOLTAGE MEASUREMENT.—The testing voltage shall be measured by one of the following methods:

- (1) A properly calibrated electrostatic voltmeter connected directly across the matting under test.
- (2) Any properly calibrated commercial type of alternating current voltmeter connected to the low-tension side of the transformer in conjunction with the ratio of transformation of the transformer, provided that the ratio is definitely known for all test conditions.
- (3) A calibrated potential transformer with a voltmeter.

VII. PACKING AND MARKING

Packing and marking shall be as called for in the proposal.

VIII. NOTES

This specification is identical except in form with standard specification D-178-24 adopted by the American Society for Testing Materials in 1924.

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